Development IoT System for Smart Maize Production in Nigeria

Authors : Oyenike M. Olanrewaju, Faith O. Echobu, Aderemi G. Adesoji, Emmy Danny Ajik, Joseph Nda Ndabula, Stephen Luka

Abstract : Nutrients are required for any soil with which plants thrive to improve efficient growth and productivity. Amongst these nutrients required for proper plant productivity are nitrogen, phosphorus and potassium (NPK). Due to factors like leaching, nutrient uptake by plants, soil erosion and evaporation, these elements tend to be in low quantity and the need to replenish them arises. However, this replenishment of soil nutrients cannot be done without a timely soil test to enable farmers to know the amount of each element in short quantity and evaluate the amount required to be added. Though wet soil analysis is good, it comes with a lot of challenges ranging from soil test gargets availability to the technical knowledge of how to conduct such soil tests by the common farmer. In this research, an Internet of Things test kit was developed to fill in the gaps created by wet soil analysis. The kit comprises components that were used to measure Nitrogen, Phosphorous and potassium (N, P, K) soil content, soil temperature and soil moisture at a series of intervals. In this implementation, the fieldwork was carried out within 0.2 hectares of land divided into smaller plots. Nitrogen values from the three reps range from 14.8 – 15mg/kg, Phosphorous 20.2-21.4 mg/kg, and Potassium 50.2-53 mg/kg. This information with soil moisture information obtained enabled the farmers to make informed and precise decisions on fertilizer applications, and wastage was avoided.

Keywords : internet of things, soil Nutrients, test kit, soil temperature

Conference Title : ICSAFS 2024 : International Conference on Sustainable Agricultural and Food Systems

Conference Location : Dubai, United Arab Emirates

Conference Dates : November 07-08, 2024